What's your E2IQ?

ENERGY LEARN

FACT SHEET

Key Terms

- Core
- Crust
- Emissions
- Fumaroles
- Geyser
- Lava
- Mantle
- Magma
- Plates
- Reservoir
- Volcano

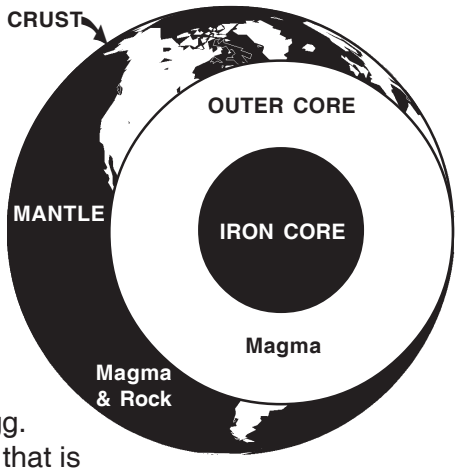
Geothermal Facts

- Geothermal comes from the Greek words “geo” (earth) and “therme” (heat).
- Most of the geothermal energy in the world occurs in the Ring of Fire – an area that rims the Pacific Ocean.
- Geothermal energy was first used to produce electricity in 1904.
- There are some mines that go a few miles into the ground where it is too hot to work unless it is cooled by air from the surface. Temperatures in these mines reach 150^0 F.

Geothermal Energy

What is geothermal energy?

The word Geothermal comes from the Greek words geo (earth) and therme (heat). Geothermal energy is heat inside the earth. The inside of the earth is very hot. We can use this heat to warm our houses. We can make electricity with it.



The earth is not a solid ball.

The earth is made in layers, like an egg. At the center is a *core* of iron. Around that is an outer core of iron and rock so hot the rock is melted. This liquid rock is called *magma.* The next layer is a mixture of rock and magma called the *mantle.* The shell of the earth – with oceans and mountains – is called the *crust.*

Where is geothermal energy?

Geothermal energy is everywhere under the ground, but sometimes it is hard to reach. In most places, the crust is miles thick. Magma is near the surface in only a few places.

Earthquakes and *volcanoes* are signs that magma is near the surface. The *lava* from volcanoes has magma in it. Most of the geothermal energy in the United States is found on the West Coast and in Hawaii.

Geothermal energy is generated in the earth’s core, almost 4,000 miles beneath the earth’s surface. The hot temperatures of the magma are continuously produced by the slow decay of radioactive particles. This process is natural in all rocks.

The mantle is about 1,800 miles thick. The crust can be three to five miles thick under the oceans and 15 to 35 miles thick on the continents.

Continued on back

The crust is broken into pieces called *plates.* Magma comes close to the earth's surface near the edges of the plates. This is where volcanoes occur. Deep underground, the rocks and water absorb the heat from the magma and lava.

We can dig wells and pump the heated, underground water to the surface. People around the world use geothermal energy to produce electricity.

Geothermal energy is renewable.

Geothermal energy is a renewable energy source because the water is replenished by rainfall and the heat is continuously produced deep within the earth. We won't run out of geothermal energy. Future generations will still have geothermal energy.

Geothermal energy can make electricity.

Power plants use steam from geothermal dry steam wells or hot water wells to make electric power. The steam is used to turn turbines to make electricity. We can use these resources by drilling wells into the earth and piping the steam or hot water to the surface. The wells are one to two miles deep. The power plants are built close to the wells. Geothermal energy produces only a small percentage of our electricity – about half of 1 percent of the electricity produced in the U.S.

The History of Geothermal Energy

Geothermal energy was used by ancient people for heating and bathing. Even today, hot springs are used worldwide for bathing and many people believe hot mineral waters have natural healing powers.

Using geothermal energy to produce electricity is a new industry. A group of Italians first used it in 1902. The Italians used the natural steam erupting from the earth to power a turbine generator.

The first successful American geothermal plant began operating in 1960 at The Geysers in northern California. There are more than 60 geothermal power plants in the United States.

Finding Geothermal Energy

What does geothermal energy look like? Some of the visible features of geothermal energy are volcanoes, hot springs, *geysers* and *fumaroles.* But, you cannot see most geothermal resources. They are deep underground. There may be no clues above ground that a geothermal reservoir is present below.

Geologists use different methods to find geothermal reservoirs. The only way to be sure there is a *reservoir* is to drill a well and test the temperature deep underground.

Geothermal Energy and the Environment

Geothermal energy does little damage to the environment. Another advantage is that geothermal plants don't have to transport fuel like most power plants. Geothermal plants sit on top of their fuel source. Geothermal power plants have been built in deserts, in the middle of crops and in mountain forests.

Geothermal plants produce almost no *emissions* because they do not burn fuel to produce electricity. And it is cheap - new plants can make electricity for about the same price as coal plants.

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